able to detect the code phase of the desired traffic channels and to synchronize with them and, if required, to measure the power level of the transmission. If the connection-specific power control is not in use, it is not necessary to measure the power level, as the power level of the traffic channel can be estimated from the power of the pilot channel already measured.

The mobile station is thus able to receive both the desired signal from its presently dedicated base station and a signal from a neighboring base station the spreading code of which it knows. Interference elimination may be an iterative process, so that the number of the rake correlators of the CDMA receiver does not limit the number of signals to be eliminated.

According to a preferred embodiment of the invention, the mobile station calculates the cross-correlation between the received desired signal and interfering signals received with the known spreading codes. The code phases of the signals have to be taken into account in the calculation, as the correlation of the spreading codes with respect to each other depends on the phase difference between them. In addition to this, the result has to be weighted by the received power level of each signal to find out the actual interference caused by each signal in the desired signal.

After having calculated the interference caused by the received signals of the neighboring cell, the mobile station can eliminate the effect of this interference from the desired signal. To eliminate the interference, each detected interfering signal is again multiplied with the spreading code and subtracted from the received signal, which then can be re-detected. The re-detected signal no longer contains the interfering signals eliminated as described above.

In addition to the above-described embodiment concerned with the elimination of interference, the invention can also be applied by performing detection in the receiver by taking all of the received signals into account at the same time. The deterministic properties of the signals interfering with the desired signal, such as their power level and code phase, are utilized in the detection.

FIG. **3** illustrates the configuration of a mobile station MS according to the invention. In the receiving direction the mobile station comprises an antenna **30** which forwards the received signal via radio-frequency sections **31** to an A D converter **32**. The converted signal is applied to RAKE correlators **34***a* to **34***d*, each one of which has synchronized with a different signal component originating from one or another of the base stations. In addition, the A D-converted signal is applied to a searcher correlator **33**, the function of which is to search for signal components transmitted with a desired spreading code by measuring the impulse response of the channel. From the correlators, the signal is applied to means **35** which preferably combine the received signal components and detect the signal. From the combiner the signal is applied to a channel decoder **36** and further via a speech decoder **37** to a loudspeaker **38**.

In the transmission direction, a signal from a microphone **39** is applied via a speech coder **40** and a channel coder **41** to spreading coding **42**, from which the signal is applied via the RF sections **31** to the antenna **30**. The mobile station further comprises means **43** controlling all of the above-mentioned blocks. The means **43** of the mobile station can store information about the spreading codes used on the connections of neighboring base stations possibly interfering with the desired signal. This information can be forwarded to the correlators **33**, **34***a* to **34***d* of the mobile station, which are able to detect the code phase of a signal using the known spreading code of a base station of the neighboring cell and measure its power level. In the detection of the desired signal, the means **35** can utilize the code phases and power levels of the signals of the neighboring base station received by the correlators **34***a* to **34***d*.

According to a preferred embodiment of the invention, the means **43** of the mobile station are able to estimate the interference caused by the measured channel of the neighboring cell by calculating a cross-correlation between the desired signal transmitted from the presently dedicated base station and the measured signal from the neighboring base station on the basis of the code phases of the signals and weighting the cross-correlation by the power levels. The mobile station further comprises means **43** for eliminating the calculated interference from the desired signal.

In addition to the above alternatives, the mobile station can also be implemented so that all of the received signals are taken into account at the same time in the detection.

Even though the invention has been described above with reference to the example shown in the attached drawings, it is obvious that the invention is not limited to this example, but it may be modified in various ways within the inventive idea claimed in the attached claims.

We claims:

1. A method for eliminating multiple-access interference in CDMA cellular radio system having a plurality of cells each comprising at least one base station arranged for communicating by CDMA with mobile stations present in a geographic area covered by the respective cell, comprising the steps of:

at least one said base station of one said cell, being a presently dedicated base station relative to at least a respective one of said mobile stations and being bordered by at least another, neighboring said cell having a respective neighboring base station, informing said mobile station of at least one CDMA spreading code used in said one cell and at least one CDMA spreading code used in at least one said neighboring cell;

said one base station and at least one said neighboring base station respectively transmitting components of a desired signal and a signal to be measured, on respective channels, using respective CDMA spreading codes;

said mobile station measuring the code phase and power level of a respective channel of each of said one cell and said at least one neighboring cell, using respective CDMA spreading codes as made known to said mobile station by said practicing of said informing step; and

said mobile station detecting, from signal components thereby received, said desired signal, by eliminating interference from said signal components as received by said mobile station, based on said measuring.

2. The method of claim **1**, wherein said detecting by eliminating comprises:

said mobile station estimating interference caused by at least one said respective channel of said at least one neighboring cell using a DMS spreading code for the respective neighboring cell as made known to said mobile station by said practicing of said informing step, by:

calculating a cross-correlation between components of said desired signal as detected from respective transmissions of said one base station and said at least one neighboring base station, and

weighting said cross-correlation with respective power levels obtained in said measuring step; and